

REMARKS

Reconsideration of the present application is respectfully requested.

The Examiner did not initial references listed on Form PTO-1449. Pursuant to MPEP §609, Applicant hereby respectfully requests that the Examiner initial the enclosed copy of the Form PTO-1449 (enclosed with a REQUEST FOR RETURN OF INITIALED FORM PTO-1449) in the appropriate place in the left-hand column as proof that the listed references have been considered and made of record. Applicant further requests that the Examiner return a copy of the initialed form to the undersigned at his earliest convenience.

Claims 1, 2, 5 and 6 have been rejected under 35 U.S.C. §103 as being unpatentable over Baba (U.S. 5,747,694) in view of Nishimura (U.S. 5,661,244). For the reasons discussed below, Applicant believes that these claims should be allowed.

Independent claim 1 recites a pressure sensor in which a filter is attached to an environmental pressure introduction port so that environmental pressure enters a case after passing through the filter. The filter has a filter surface that is positioned along a gravitational direction when the pressure sensor is used. Therefore, even when moisture in the environmental pressure medium (air) attaches to the filter surface, the moisture is liable to slip and drop from the filter surface due to its own weight. Thus, the filter hardly clogs with moisture, thereby preventing the introduction passage of the environmental pressure from being closed (page 11, lines 4-13).

Baba discloses a pressure sensor having a filter 20 disposed at an upper portion of an environmental pressure passage 19 (FIG. 1 and column 9, lines 19-38). However, the filter 20 is disposed on a case 11 so that a filter surface thereof is positioned along a horizontal direction when the pressure sensor is used.

Nishimura discloses a pressure sensor having a filter 13 disposed at a lower portion of an environmental pressure passage 12a (FIG. 1 and column 2, lines 54-58). However, the filter 13 is also disposed so that a filter surface thereof is positioned along a horizontal direction when the pressure sensor is used.

Neither Baba nor Nishimura teaches or suggests a filter that is disposed so that its surface is positioned along a gravitational direction when the pressure sensor is used, and therefore Applicant respectfully requests that the examiner's §103 rejection of claim 1, as well as dependent claims 2, 5 and 6, be withdrawn.

Claims 3 and 4 have been rejected under 35 U.S.C. §103 as being unpatentable over Baba in view of Nishimura and Kofoed (5,379,650). In response, Applicant has amended claim 3. Therefore, this rejection is respectfully traversed.

Amended claim 3 recites the environmental pressure introduction port is composed of a plurality of opening portions that are divided by a frame, each of which introduces an identical pressure as the environmental pressure. Thus, a contact area of air flowing in the environmental pressure introduction port and moisture is increased due to the frame in comparison with a case having an environmental pressure introduction port composed of a single opening portion, so that even a little moisture can be promoted to condense. As a result, moisture is collected by the filter, and moisture ingress inside the filter is prevented. Consequently, the water removing performance of the filter can be enhanced (page 15, line 27 to page 16, line 13). That is, moisture condenses and drops from the filter more easily, so that moisture can be removed more efficiently. The environmental pressure (the identical pressure) can be introduced more certainly compared with when the environmental pressure introduction port is composed of the single opening portion.

Kofoed discloses a pressure sensor having two ports. However, the two ports respectively introduce different pressures. That is, in the pressure sensor disclosed in Kofoed, one of the two ports introduces a pressure of the upper reaches of a strut 14, while the other one of two ports introduces a pressure of a lower reaches of the strut 14. Therefore, the pressure sensor detects a differential pressure between the upper reaches and the lower reaches of the strut 14. Accordingly, Kofoed fails to disclose a plurality opening portions of the environmental pressure introduction port that introduces an identical pressure as the environmental pressure.

Neither Baba, Nishimura nor Kofoed teaches or suggests not only the characteristics as mentioned in claim 1 but also introduction of an identical pressure as the environmental pressure through the plurality of opening portions of the environmental pressure introduction port, and therefore Applicant respectfully requests that the examiner's §103 rejection of claims 3 and 4 be withdrawn. Further as claims 3 and 4 depend from claim 1, they are also allowable for the same reasons discussed above regarding claim 1.

Claims 7-11 have been rejected under 35 U.S.C. §103 as being unpatentable over Baba in view of Nishimura and Kofoed. In response, Applicant has amended claim 7 as in claim 3. Accordingly, the present invention as claimed in claim 7, as amended, has the same characteristics as in amended claim 3, and therefore it is allowable for the same reasons as amended claim 3 as well as claims 8-11 dependent thereon.

Claims 12-14 have been rejected under 35 U.S.C. §103 as being unpatentable over Kofoed in view of Nishimura. In response, Applicant has amended claim 12. Therefore, this rejection is respectfully traversed.

Amended claim 12 recites that the filter of the pressure sensor is disposed to define a gap portion between a frame and the filter for conducting the environmental pressure into the case. The gap portion can securely conduct the environmental pressure toward a sensor element even

if the filter surface clogs (page 16, line 14 to page 17, line 2). Therefore, the environmental pressure introduction port can be prevented from being closed when the entire region of the filter surface is clogged with foreign matter.

Although, Kofoed discloses a pressure sensor, it fails to disclose a filter for repelling water and the like.

Nishimura discloses the pressure sensor in which the filter is located on the environmental pressure passage (column 2, lines 54-58). However, Nishimura fails to disclose a gap portion defined between a frame and the filter for conducting the environmental pressure into the case.

Neither Kofoed nor Nishimura teaches or suggests the gap portion defined between a frame and the filter for conducting the environmental pressure into the case. Therefore, Applicant respectfully requests that the examiner's §103 rejection of claim 12, as well as dependent claims 13 and 14, be withdrawn.

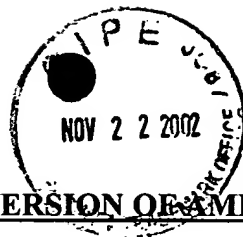
In view of the above amendments and remarks, the present application is now believed to be in condition for allowance. A prompt notice to that effect is respectfully requested.

Respectfully submitted,



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MARKED UP VERSION OF AMENDED SPECIFICATION AND CLAIMS

SPECIFICATION

Please change the paragraph beginning at page 8, line 6 as follows:

Here, FIGS. 4A and 4B show enlarged views of the vicinity of the atmospheric pressure introduction port 10. FIG. 4A is an enlarged plan view corresponding to FIG. 2, while FIG. 4B is an enlarged cross-sectional view corresponding to FIG. 1. In FIGS. 2 and 4A, the water repellent filter 12 is hatched. In FIG. 4B, although angle $[\cdot] \theta$ formed between the filter surface and the gravitational direction is $[0.] 0^\circ$, it is not limited to $[0.] 0^\circ$. A preferable range of angle $[\cdot] \theta$ is $[0] 0^\circ$ to $[45.] 45^\circ$.

IN THE CLAIMS

Please amend claims 3, 7 and 12 as follows:

3. (Amended) The pressure sensor according to claim 1, wherein the environmental pressure introduction port is composed of a plurality of opening portions that are divided by a frame, each of which introduces an identical pressure as the environmental pressure

7. (Amended) A pressure sensor comprising:
a case having an environmental pressure introduction port;
a sensor element unit disposed in the case for detecting a pressure based on an environmental pressure introduced into the case through the environmental pressure introduction port; and

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a filter attached to the environmental pressure introduction portion so that the environmental pressure is introduced into the case after passing through the filter, wherein:

the environmental pressure introduction port is divided into a plurality of opening portions that are covered with the filter, each of which introduces an identical pressure as the environmental pressure.

12. (Amended) A pressure sensor comprising:

a case having a measurement pressure introduction passage extending in a vertical direction for introducing a measurement pressure and an environmental pressure introduction passage extending in a horizontal direction and having an environmental pressure introduction port that is open in the horizontal direction for introducing an environmental pressure;

a sensor element disposed in the case for detecting the measurement pressure based on the environmental pressure; [and]

a filter covering the environmental pressure introduction port[.]; and

a frame located in the environmental pressure introduction passage;

wherein the filter is disposed to define a gap portion between the frame and the filter for conducting the environmental pressure into the case.